

Amendments to the Claims

Claim 1 (Previously amended): Seed of maize inbred line designated PH54M, representative seed of said line having been deposited under ATCC Accession No. PTA-4527.

Claim 2 (Original): A maize plant, or parts thereof, produced by growing the seed of claim 1.

Claim 3 (Previously amended): The maize plant of claim 2, wherein said plant is detasseled.

Claim 4 (Previously amended): A tissue culture of regenerable cells or protoplasts from the plant of claim 2.

Claim 5 (Original): A tissue culture according to claim 4, the cells or protoplasts being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

Claim 6 (Previously amended): A maize plant regenerated from the tissue culture of claim 4, capable of expressing all the morphological and physiological characteristics of inbred line PH54M, representative seed of which have been deposited under ATCC Accession No. PTA-4527.

Claim 7 (Original): A method for producing a first generation (F₁) hybrid maize seed comprising crossing the plant of claim 2 with a different inbred parent maize plant and harvesting the resultant first generation (F₁) hybrid maize seed.

Claim 8 (Previously amended): The method of claim 7 wherein the plant of inbred maize line PH54M is the female or male parent.

Claim 9 (Currently amended): An F₁ hybrid seed produced by the method of claim 7, wherein said hybrid seed comprises a single set of maize chromosomes of PH54M ~~crossing the inbred maize plant according to claim 2 with another, different maize plant.~~

Claim 10 (Original): An F₁ hybrid plant, or parts thereof, grown from the seed of claim 9.

Claim 11 (Currently amended): The maize plant, or parts thereof, of claim 2, wherein the plant or parts thereof have been transformed so that its genetic material further comprises contains one or more transgenes that confer a qualitative trait transgene, said transgene selected from the group consisting of: a disease resistance gene, an insect resistance gene, a herbicide resistance gene, an oil gene, a starch gene and a seed storage protein gene.

Claim 12 (Currently amended): A method for producing a first generation (F₁) maize plant comprising crossing the maize plant of claim 11 with a second plant of another maize line.

Claim 13 (Currently amended): The first generation (F₁) maize plant, or parts thereof, produced by the method of claim 12, wherein said first generation (F₁) maize plant, or parts thereof, comprises a single set of maize chromosomes of PH54M with the transformed genetic material.

Claim 14 (Currently amended): A maize plant, or parts thereof, wherein at least one ancestor of said maize plant is the maize plant of claim 2, said maize plant expressing a ~~combination of at least two~~ the following PH54M traits which are not ~~significantly~~ significantly different from PH54M traits when determined at a 5% significance level and when grown in the same environmental conditions, said PH54M traits selected from the group consisting of: a relative maturity of 98 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, grain yield, resistance to late season stalk lodging, and resistance to Northern Leaf Blight; and wherein other plants utilized in the development of said maize plant do not exhibit a statistically significant variation from such PH54M traits when determined at a 5% significance level and when grown in the same environmental conditions as PH54M.

Claim 15 (Previously amended): A method for developing a PH54M-progeny maize plant in a maize plant breeding program using plant breeding techniques, which include employing a maize plant, or its parts, as a source of plant breeding material, comprising: obtaining the maize plant, or its parts, of claim 2 as a source of said breeding material.

Claim 16 (Previously amended) The method of claim 15 wherein plant breeding techniques are selected from the group consisting of: recurrent selection, backcrossing, pedigree breeding, restriction fragment length polymorphism enhanced selection, genetic marker enhanced selection, and transformation.

Claims 17-20 (Canceled)

Claim 21 (Previously amended): A maize plant, or parts thereof, having all the physiological and morphological characteristics of inbred line PH54M, representative seed of said line having been deposited under ATCC Accession No. PTA-4527.

Claim 22 (Currently amended): The maize plant of claim 2, wherein genes controlling cytoplasmic male sterility have been transferred into said maize plant through ~~crossing~~ backcrossing that utilizes PH54M as a recurrent parent, wherein PH54M is a recurrent parent, and wherein said plant has essentially the same morphology and physiology of inbred maize line PH54M other than the trait of male sterility and wherein said maize plant exhibits no statistically significant variation from PH54M other than the trait of male sterility, when determined at a 5% significance level and when grown in the same environmental conditions as PH54M.

Claim 23 (Previously amended): A tissue culture of regenerable cells or protoplasts from the plant of claim 21.

Claim 24 (Original): A tissue culture according to claim 23, the cells or protoplasts being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

Claim 25 (Previously amended): A maize plant regenerated from the tissue culture of claim 23, capable of expressing all the morphological and physiological characteristics of inbred line PH54M, representative seed of which have been deposited under ATCC Accession No. PTA-4527

Claim 26 (Original): A method for producing a first generation (F₁) hybrid maize seed comprising crossing the plant of claim 21 with a different inbred parent maize plant and harvesting the resultant first generation (F₁) hybrid maize seed.

Claim 27 (Previously amended): The method of claim 26 wherein the inbred maize plant having all the morphological and physiological characteristics of inbred maize plant PH54M is the female or male parent.

Claim 28 (Currently amended): An F₁ hybrid seed produced by the method of claim 26, wherein said hybrid seed comprises a single set of maize chromosomes of PH54M ~~crossing the inbred maize plant according to claim 21 with another, different maize plant.~~

Claim 29 (Original): An F₁ hybrid plant, or parts thereof, grown from the seed of claim 28.

Claims 30-33 (Canceled)

Claim 34 (Previously amended): A method for developing a PH54M-progeny maize plant in a maize plant breeding program using plant breeding techniques, which include employing a maize plant, or its parts, as a source of plant breeding material, comprising: obtaining the maize plant, or its parts, of claim 21 as a source of said breeding material.

Claim 35 (Previously amended): The method of claim 34 wherein plant breeding techniques are selected from the group consisting of: recurrent selection, backcrossing, pedigree breeding, restriction fragment length polymorphism enhanced selection, genetic marker enhanced selection, and transformation.

Claim 36 (Canceled)

Claim 37 (Previously amended): A process for producing inbred PH54M, representative seed of which have been deposited under ATCC Accession No. PTA-4527, comprising:

- (a) planting a collection of seed comprising seed of a hybrid, one of whose parents is inbred PH54M said collection also comprising seed of said inbred;
- (b) growing plants from said collection of seed;
- (c) identifying said inbred PH54M plants;
- (d) selecting said inbred PH54M plant; and
- (e) controlling pollination in a manner which preserves the homozygosity of said inbred PH54M plant.

Claim 38 (Original): The process of claim 37 wherein step (c) comprises identifying plants with decreased vigor.

Claim 39 (Original): The process of claim 37 wherein step (c) comprises identifying seeds or plants with homozygous genotype.

Claim 40 (Previously amended): A method for producing a first generation (F1) PH54M-progeny maize plant, comprising:

- (a) crossing inbred maize line PH54M, representative seed of said line having been deposited under ATCC Accession No. PTA-4527, with a second maize plant to yield progeny maize seed;
- (b) growing said progeny maize seed, under plant growth conditions, to yield said first generation PH54M-progeny maize plant.

Claim 41 (Currently amended): A first generation (F1) PH54M-progeny maize plant, or parts thereof, produced by the method of claim 40, wherein said PH54M-progeny maize plant comprises a single set of maize chromosomes of PH54M.

Claim 42 (Currently amended): A ~~The~~ method for producing a ~~PH54M progeny~~ an inbred maize plant, comprising generating the first generation (F1) PH54M-progeny maize plant by the method of claim 40 and further comprising: selfing said first generation (F1) PH54M-progeny maize plant for successive filial generations to generate a ~~PH54M inbred progeny~~ an inbred maize plant.

Claim 43 (Previously amended): The PH54M inbred progeny maize plant, or parts thereof, produced by the method of claim 42.

Claims 44-46 (Canceled)

Claim 47 (Currently amended): The maize plant, or parts thereof, of claim 2, further comprising one or more ~~genes~~ mutant gene or transgene that have been transferred into said maize plant by utilizing PH54M as a recurrent parent and wherein the maize plant, or parts thereof, ~~are essentially unchanged from inbred maize line PH54M~~ exhibit no statistically significant variation from PH54M, other than variation caused by the addition of said mutant gene or transgene, and wherein significance is determined at a 5% significance level and when grown in the same environmental conditions as PH54M.

Claim 48 (Currently amended): The maize plant of claim 47, wherein at least one of the ~~genes~~ mutant gene or transgene is a dominant allele.

Claim 49 (Currently amended): The maize plant of claim 47, wherein at least one of the ~~genes~~ mutant gene or transgene is a recessive allele.

Claim 50 (Currently amended): The maize plant of claim ~~2~~ 47, wherein ~~said mutant gene or transgene confers~~ further comprising a gene wherein said gene confers a trait selected from the group consisting of herbicide resistance, insect resistance, disease resistance, white grain, and waxy grain.

Claim 51 (Currently amended): ~~The~~A method of developing an inbred PH54M maize plant conferring a backcrossed trait comprising crossing the maize plant of claim 2 to a second maize plant and utilizing PH54M as the recurrent parent, wherein the backcrossed in trait is selected from a group consisting of herbicide resistance, insect resistance, disease resistance, white grain and waxy grain.

Claim 52 (Currently amended): The inbred PH54M maize plant produced by the method ~~conferring a backcrossed trait~~ of claim 51, wherein said inbred PH54M maize plant conferring a backcrossed trait has ~~essentially~~ the same traits as inbred PH54M except for the backcrossed trait and wherein the backcrossed in trait is selected from a group consisting of herbicide resistance, insect resistance, disease resistance, white grain and waxy grain.

Claim 53 (Previously added): The method of crossing the inbred PH54M maize plant conferring a backcrossed trait of claim 52 with a second maize plant to develop a first generation (F1) maize plant.

Claim 54 (New): A method of making a PH54M maize plant comprising: introgressing a mutant gene or a transgene that encodes a product that confers insect resistance into an inbred maize line PH54M, representative samples of which have been deposited as PTA-4527.

Claim 55 (New): The maize plant produced by the method of claim 54.

Claim 56 (New): The maize plant produced by the method of claim 54 wherein said mutant gene or transgene is an insect resistance gene encoding a *Bacillus thuringiensis* polypeptide.

Claim 57 (New): A method of making a first generation hybrid maize plant comprising the method of claim 54 and further comprising crossing the PH54M maize plant of claim 54 with a second maize plant.

Claim 58 (New): A method of making a PH54M maize plant comprising: introgressing a mutant gene or a transgene that encodes a product that confers herbicide resistance into an inbred maize line PH54M, representative samples of which have been deposited as PTA-4527.

Claim 59 (New): The maize plant produced by the method of claim 58.

Claim 60 (New): The maize plant produced by the method of claim 58 wherein said mutant gene or transgene is an herbicide resistance transgene selected from the group consisting of: a transgene conferring glyphosate resistance, a transgene conferring glufosinate resistance, a mutant gene or transgene conferring imidazolinone resistance and a mutant gene or transgene conferring sulfonylurea resistance.

Claim 61 (New): A method of making a first generation hybrid maize plant comprising the method of claim 58 and further comprising crossing the PH54M maize plant of claim 58 with a second maize plant.

Claim 62 (New): A method of making a PH54M maize plant comprising: introgressing a mutant gene or a transgene that encodes a product that confers disease resistance into an inbred maize line PH54M representative samples of which have been deposited as PTA-4527.

Claim 63 (New): The maize plant produced by the method of claim 62.

Claim 64 (New): A method of making a first generation hybrid maize plant comprising the method of claim 62 and further comprising crossing the PH54M maize plant of claim 62 with a second maize plant.

Claim 65 (New): A method of making a PH54M maize plant comprising: introgressing a gene that confers male sterility into an inbred maize line PH54M representative samples of which have been deposited as PTA-4527.

Claim 66 (New): The maize plant produced by the method of claim 65 wherein said gene is a mutant gene or transgene that confers male sterility.

Claim 67 (New): The maize plant produced by the method of claim 65 wherein said gene is a cytoplasmic gene and said maize plant comprises the nuclear genetic component of inbred PH54M and a cytoplasm that confers male sterility.

Claim 68 (New): A method of making a first generation hybrid maize plant comprising the method of claim 65 and further comprising crossing the PH54M maize plant of claim 65 with a second maize plant.

Claim 69 (New): A method of making a PH54M maize plant comprising: introgressing a mutant gene or a transgene that encodes a product that modifies fatty acid metabolism, that decreases phytate content, or that modifies starch metabolism into an inbred maize line PH54M, representative samples of which have been deposited as PTA-4527.

Claim 70 (New): The maize plant produced by the method of claim 69.

Claim 71 (New): A method of making a first generation hybrid maize plant comprising the method of claim 69 and further comprising crossing the PH54M maize plant of claim 69 with a second maize plant.

Claim 72 (New): The maize plant produced by the method of claim 54 wherein said maize plant exhibits no statistically significant variation in morphological or physiological characteristics from PH54M, other than variation caused by the addition of said mutant gene or transgene, and wherein significance is determined at a 5% significance level when grown in the same environmental conditions as PH54M.